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Dear Ms. Adams:

On behalf of the International Wildlife Coalition I thank you for the opportunity to provide comments regarding the Draft Environmental Impact Statement and Biological Assessment for the Cape Wind Project. First of all, the IWC appreciates the efforts by Cape Wind Associates to pursue non-fossil fuel generated electricity. However, we are troubled that the impacts on wildlife, particularly those on marine mammals, continue to be inadequately considered and misrepresented within the Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR). Problems currently exist with inadequate monitoring practices, as well as inaccurate assumptions regarding avian counts, noise assessments and acoustic impacts, and the expected avoidance of whales from collisions with ships.

Acoustic Impacts

Acoustic impacts on marine mammals as a result of manmade noise is a major concern. The DEIS/DEIR points out that the threshold intensity of constant or impulsive sounds for injury to the hearing apparatus of marine mammals and turtles is about 200 to 220 dB *re* 1 μPa, and that physical injury to a marine mammal's hearing capability would not

arise at received transient sound levels of <180 dB *re* 1 μPa[1]. The National Marine Fisheries Service (NMFS) has identified 180dB as the threshold level for preventing injury or harassment to marine mammals and sea turtles[2]. Regarding the acoustic impact of the Wind Park, it is generally agreed that the greatest impact will come from the driving of piles to install the turbines. However, in modeling the sound generated from the wind farm construction, the Corps presents a variety of data, ranging from 172 decibels (dBL) at a distance of 500 meters[3], 178 dBL at 500 meters[4], and a rather random selection of 170 dBL at a distance of 4,003 feet (1,220 meters).[5] This last distance does not comply with the 500-meter safety radius presented as a condition of the Corps's construction and operation of the Scientific Measurement Devices Station.[6] Rather, it seems the only distinction of 4,003 feet is that it's the distance where sound levels drop below 180 dBL. The potential here is that some of these sound levels and various distances for modeling were selected arbitrarily.

While the difference of 8 decibels (between 170-178 dB) may not seem like very much, the DEIS/DEIR even states that the decibel system is logarithmic, so that a sound of 70 dB added to another sound of 70 dB only increases the decibel level by 3 dB (it is not a doubling to 140 dB). "Thus, every 3 dB increase represents a doubling of sound energy, and a 10 dB increase represents ten-times as much sound energy."[7] According to this, the varying calculations of sound generated by pile driving activity are almost an order of magnitude different from one another.

Another troubling detail within the DEIS/DEIR is the non-standard expression of units as simply decibels (dB) with no reference intensity or distance. A decibel is a relative term,

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[1] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at 5.5.6.2.1, p5-86, 5-87.
[2] *Id.*
[3] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at 5.11.2.6, p5-221.
[4] 2004 Cape Wind Energy Project Draft Environmental Impact Statement, Marine Biological Assessment for the Cape Wind Project, Army Corps of Engineers at Appendix 5.5-A, p45.
[5] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at 5.5.6.1.1, p5-77
[6] *Id.*
[7] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at 5.11.1.1 p212.

expressing a ratio of intensities (i.e., the intensity at 1 m from a sound source vs. the intensity at 500 m from a sound source).[8] For instance, an accurate representation of a sound level would be 175 dB *re* 1 μPa at 1m. Furthermore, the NMFS set threshold is referred to as 180 dB at 500m, not 180dBA (no reference distance listed),[9] or 180 dB (no reference distance listed),[10] as indicated in the DEIS/DEIR. Additionally, the A-weighted decibel scale (dBA) expresses the relative loudness of sounds in air as perceived by the human ear. This correction (from dB to dBA) is made because the human ear is less sensitive at low audio frequencies, especially below 1000 Hz, than at high audio frequencies.[11] Although the Kurkul, 2002 reference cited within the DEIS/DIER listing the NMFS thresholds refers to a letter addressed to Christine Godfrey of the U.S. Army Corps of Engineers (and thus not readily available to the public), we believe it is safe to assume that when discussing thresholds set for marine mammals, that underwater decibel levels would not or should not be adjusted to accommodate the limited human ear.

The DEIS/DEIR finally reports in Appendix 5.11-A that acoustic measurements both above and below water were made during the pile driving process during construction of the Scientific Measurement Devices Station. The underwater L_{max} sound levels ranged from 145 to 167 dBL at a distance of 500m. However, sound source levels of similar pile driving efforts in Europe ranged from 150-236 dB at the source, and in Denmark, pile driving activities were recorded at 190 dB *re* 1 μPa at ½ nm.[12] We are understandably concerned about pile driving activities for the actual turbines (not just the smaller scale scientific data station) reaching or exceeding these levels, as well as the potential for cumulative impacts if pile driving and cable laying occur in more than one location at the same time.

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[8] Au, Whitlow. 1993. *The Sonar of Dolphins*. Springer-Verlag, 277pp.
[9] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at 5.5.6.2.1 p87.
[10] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at 5.5.6.1 p5-77.
[11] "A-weighted decibels" website: http://whatis.techtarget.com/definition/0,,sid9_gci955021,00.html. Accessed 2/23/2005.
[12] Tougaard, Jacob. 2005. *Wind Farms and Marine Mammals in Danish Waters*. Presented at the Woods Hole Oceanographic Institution January 20, 2005.

Finally, in addition to expanded monitoring and review of existing data regarding the presence of marine mammals in Nantucket Sound (or wherever wind farm construction occurs), we would also like to see more evidence of proposed mitigation for marine mammal impacts. These mitigation measures could be temporal (construction when marine mammals, particularly North Atlantic right whales, are not in the area), spatial (sighting the farm in an area least likely to impact wildlife), or even acoustical mitigation (such as the use of bubble curtains). For instance, bubble curtains have been shown to reduce noise levels from pile driving activity by three decibels[13], to as much as 30 decibels.[14] One use of bubble curtains in Canada during pier construction reduced pile driving noise by as much as 90 decibels.[15] These measures, of course, would not allow for the replacement of marine mammal observers during construction, as animals are unpredictable and could potentially be found in the construction area at any time.

Habitat Exclusion

The DEIS does not discuss the issue of habitat exclusion that may be caused by the placement of the turbines resulting either from physical exclusion or acoustic harassment. Most baleen whales, including the critically endangered right whale, have a peak hearing range within the operational frequency. If low frequency noise emitted during operation of the turbines is aversive to marine mammals in the area, they may choose to avoid passing within the range of this sound which could exclude them from areas that may be productive in food resources.[16]

The monitoring process conducted (and proposed in the future) is inadequate to assess the impact on marine mammal habitat use. One well-monitored site is the 100MW wind farm constructed during 2002-2003 in a shallow coastal area in the Danish part of the western Baltic Sea. At this site, the impact on harbor porpoises was assessed by means of acoustic

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[13] Wursig, B., C.R. Greene, T.A. Jefferson. 2000. Development of an Air Bubble Curtain to Reduce Underwater Noise of Percussive Piling. *Marine Environmental Research*, 49: 79-93.
[14] Rodkin, R and J. Reyff. 2004. Underwater sound pressures from marine pile driving. Journal of the Acoustic Society of America. 116, 2648.
[15] Peter Scheifele, personal communication, Feb. 23rd, 2005.
[16] Baumgartner,M and B Mate 2004. Summer and Fall Habitat of North Atlantic Right Whales Inferred from Satellite Telemetry. Can. J. of Fisheries and Aquatic Sciences. In Press.

porpoise detectors (T-PODs) continuously monitoring porpoise echolocation activity.[17] In that study, waiting times, defined as the period between two consecutive encounters of echolocation activity, generally increased from two hours prior to the onset of construction work to four hours in the wind farm area during the construction, while the porpoise activity in the control area increased slightly. A pronounced additional effect was found during the ramming and vibration of steel sheet piles into the seabed around a single wind turbine foundation, resulting in an increase in waiting times from four hours to more than 24 hours. The analysis shows that harbor porpoise habitat use was significantly impacted by the offshore wind farm construction.

The Danish model for monitoring would serve the Cape Wind and other offshore wind farm projects well. As Dr. Jakob Tougaard of the National Environmental Research Institute of the Danish Ministry of the Environment pointed out in a recent presentation, an extensive wildlife monitoring project for impacts before, after and during construction of offshore wind farms is necessary.[18] In that program, monitoring two offshore wind farms (Nysted and Horns Rev), visual surveys were combined with automatic detection systems (such as the acoustic detection T-PODs mentioned above, as well as remotely operated video cameras to watch seals), and telemetry studies. The remotely operated video cameras indicated that significantly fewer animals were on land at the Nysted wind farm site during days with pile driving than days without. They also found conflicting results between the Nysted and Horns Rev wind farm sites, indicating that the use of multiple monitoring techniques, as well as local knowledge is necessary. [19]

We have additional concerns regarding the pinniped assessment in the Marine Biological Assessment (MBA) that addresses harbor seals and grey seals simultaneously since both species are considered to be "similar." However, it is important to consider that, while the

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[17] Henricksen, O.D., J. Carstensen and J. Teilmann. 2004. Impact on harbour porpoise from the construction of the Nysted offshore wind farm in Denmark: Acoustic monitoring of echolocation activity using porpoise detectors (T-pods). Available at: http://www.havpattedyr.dk/Ekstra%20stuff/Program.pdf#search='henriksen%20harbor%20porpoise%20nysted'

[18] Tougaard, Jacob. 2005. *Wind Farms and Marine Mammals in Danish Waters.* Presented at the Woods Hole Oceanographic Institution January 20, 2005

[19] *Id.*

species may be biologically similar, gray seals reside in the area year round and therefore, molt and pup there. These behaviors are sensitive and require tremendous amounts of haul-out time where disturbances disrupt mating, reduce pup survivorship, and impact molting.

A 2001 study by Sundberg and Soderman specifically looked at the impacts of grey seals from wind power.[20] They concluded that major work should be avoided during molting and extraordinary activity should be avoided during breeding times. Another study by Koschinski et al (2003) proposes that low frequency mating calls made by male harbor seals may be masked during wind turbine construction that could negatively impact reproduction.[21] They also suggest that construction activities be scheduled to minimize impacts, particularly avoiding work during calving and reproductive periods. The DEIS indicates that winter construction will be conducted, and molting and calving for gray seals occurs from December through May. Given the predicted sound propagation from pile driving, we do not feel that potential impacts on this population during these times are adequately being addressed.

It is also important to note that almost all pinniped impact studies only consider changes in haul out locations and densities and do not directly consider foraging impacts. We do not believe the DEIS or MBA adequately address this issue either.

Furthermore, the DEIS is misleading when it says that white-sided dolphins, striped dolphins, common dolphins, long-finned pilot whales, harp seals and hooded seals have the potential, or it is possible for them to occur in Nantucket Sound. In fact, data regarding occurrence can be obtained synoptically by looking at stranding patterns. This data indicate that, in the last six years, at least 13 different species including more than 241 marine mammal strandings have occurred in and around Nantucket Sound. These

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[20] Jan Sundberg & Malin Soderman. 2001. Windpower and Grey Seals: An impact assessment of potential effects by sea-based windpower plants on a local seal population. Anceps Ekologidata Department of Animal Ecology Uppsala University.

[21] Koschinksi, S; Culik, B; Henriksen, O; Tregenza, N; Ellis, G; Jansen, C; Kathe, G. 2003. Behavioural reactions of free-ranging porpoises and seals to the noise of a stimulated 2MW wind power generator. *Marine Ecology Progress Series* Vol 265: 263-273.

strandings include, but not limited to: humpback whales (an endangered species); minke whales; common dolphins; pilot whales; Risso's dolphins; Kogia, spp.; harbor porpoise; striped dolphins; spotted dolphins; gray seals; hooded seals; harp seals; and harbor seals. Recent stranding sites range from Woods Hole to Chatham including Falmouth, Yarmouth and West Dennis.[22] More importantly, as discussed below, critically endangered North Atlantic right whales have also been documented in the Sound.

Increased Vessel Activity and Ship Strikes

Another concern with marine mammals in the area of the Wind Park is the potential for ship strikes by construction and maintenance vessels for the Park. This issue is of particular concern for the critically endangered North Atlantic right whale, as ship collision poses a significant source of mortality for this species. Of the 45 confirmed deaths of North Atlantic right whales between 1970 and 1999, 16 are known to have been caused by ship strikes and two additional collisions were judged as possibly fatal, accounting for 35.5% to 40% of all known North Atlantic right whale deaths.[23] Additionally, research on the rates and potential causes of mortality in North Atlantic right whales cites the high incidence of entanglement scarring (with relatively low mortality rates), and low incidence of ship strike scarring (with relatively high mortality rates) to indicate that entanglements are more common than reported, but appear to be less dangerous than ship/whale collisions.[24] (This is not mentioned in the DEIS/DEIR, though this same study is cited within it.)

Furthermore, the Marine Biological Assessment for the Cape Wind Project (Appendix 5.5-A) cites outdated data to state that there are few historic sightings of right whales in Nantucket Sound. The assessment reports its latest sighting data occurring in 1974 (with other historical sightings in the 1600s and 1700s). More recent data indicates that, just in the past three years, there have been a number of sightings of right whales in Nantucket

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[22] Patchett, Kristen. Stranding Coordinator. Cape Cod Stranding Network, P.O. Box 287 Buzzards Bay, MA 02532 P: 508.743.9805 • Fax: 508.759.5477

[23] Knowlton, A.R., and S.D. Kraus 2001. Mortality and serious injury of northern right whales (Eubalaena glacialis) in the western North Atlantic Ocean. *Journal of Cetacean Research and Management (Special Issue)* 2: 193-208.

[24] Kraus, Scott D. 1990. Rates and Potential Causes of Mortality in North Atlantic Right Whales (*Eubalaena glacialis*). *Marine Mammal Science*, 6(4): 278-291.

Sound including an opportunistic sighting published by the National Marine Fisheries Service (NMFS) on October 10, 2004 at coordinates 4124N/07007W, within Nantucket Sound.[25] Additionally, recent satellite telemetry data conducted by Mark Baumgartner and Bruce Mate has indicated that Nantucket Shoals may be an area of frequent use, with whales repeatedly crossing through the Sound. During this study, only 16 North Atlantic right whales were tagged with satellite transponders to track animals, and out of only 16 animals, one animal spent a significant amount of time within Nantucket Sound.[26]

The Marine Biological Assessment of the DEIS/DEIR states that "baleen whales can easily detect and respond to sounds of the frequency range and intensity of those produced by tugboats and barges...Thus, right, humpback, and fin whales are likely to detect and respond to the sounds of an approaching tug and barge. Fin and right whales appear to be more wary of approaching boats, and are more likely to move away from vessels."[27] This is shockingly inaccurate. Given that the majority of human-induced mortality in right whales is a result of ship strikes, it's highly unlikely that right whales reliably move away from vessels. Right whales do not move out of the path of oncoming vessels.

Recent studies to assess risk factors involved in ship strikes used a multi-sensor acoustic recording tag to measure the responses of whales to passing ships. Right whales equipped with a digital acoustic tag had recordings of ship noise, social sounds of other right whales and a signal designed to alert the whales played back to the animals. [28] The whales reacted strongly to the alert signal, they reacted mildly to the social sounds of conspecifics, but they showed no such responses to the sounds of approaching vessels as

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[25] NOAA/NMRS Right Whale Sighting Advisory System. October, 2004. Available at: http://whale.wheelock.edu/whalenet-stuff/reportsRW_NE/04/rw_survey10_04.html

[26] Baumgartner,M and B Mate 2004. Summer and Fall Habitat of North Atlantic Right Whales Inferred from Satellite Telemetry. Can. J. of Fisheries and Aquatic Sciences. In Press.

[27] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at p42.

[28] Nowacek, D.P, M.P Johnson and P.L. Tyack, 2004. North Atlantic right whales (*Eubalaena glacialis*) ignore ships but respond to alerting stimuli. Proceedings of the Royal Society of London, Series B: Biological Sciences, 271 (1536): 227-231.

well as actual vessels. Whales responded to the alert by swimming strongly to the surface (which potentially could be elicited via a similarly loud noise such as in the Wind Park construction), a response likely to increase rather than decrease the risk of collision.

I also refer the Corps to the recent Advance Notice of Proposed Rulemaking issued by the NMFS regarding ship strikes and right whales.[29] In fact, the data actually indicate that the mortality rate, not strike rate, declines if the striking vessel is moving at < 14kts. Speeds of maintenance vessels are not discussed in the Biological Assessment or the DEIS. These vessels are capable of speeds far greater than 14 knots, therefore increasing the risk of mortality. Furthermore, maintenance vessels for the wind farm will be departing from Quonset, RI, but no dedicated surveys have been conducted to indicate the right whale occurrence and likelihood of interaction during transit to and from that port. Additionally, while the DEIS projects approximately 250 days of vessel transits through the Project site, the Horns Rev wind project reported two regular maintenance trips per turbine per year and three unscheduled maintenance trips per turbine per year. For a project with 130 turbines this would translate to approximately 650 trips per year, which poses a much larger risk of disturbance or collision than is considered in the DEIS.

We are additionally concerned that assumptions regarding critically endangered North Atlantic right whales are based on historical data which may not reflect the current or future habitat use of these animals. Since right whales in the Gulf of Maine are drawn to food resources, and *Centropages typicus* (Copepoda: Calenoida) density is believed to be dependent on water salinity and temperature,[30] shifts in food supply will likely result in shifts in right whale habitat use temporally and spatially. This is further supported by the recent testimony of William Curry (Ocean and Climate Change Institute Director at the Woods Hole Oceanographic Institution) to the Senate Committee on Commerce, Science and Transportation. In his testimony, Dr. Curry stated that there have been "*intriguing changes in the ocean that have (been) detected in only the last two years*" and that "*these*

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[29] Advanced Notice of Proposed Rulemaking on Proposed Right Whale Ship Strike Strategy. 2004. *Federal Register*, 69(105): 30857-30864.

[30] Fransz, H., Colebrook, J., Gamble, J., & Kraus, M. (1991) The Zooplankton of the North Sea. Netherlands *Journal of Sea Research* 28(1-2) 1-52.

rapid climate shifts are linked to changes in ocean circulation—in particular, to changes in the North Atlantic that make waters there less salty."[31]

This type of shift may increase what is now considered to be out of season and out of habitat sightings of right whales. For example, historical sightings demonstrate that in August, the majority of right whales are found in Canadian waters, particularly in the Bay of Fundy and Roseway Basin. This is supported by the August 2001 and 2002 data set where very few right whales sightings occurred in the southern Gulf of Maine (GOM). The August 2001 reports include only a single right whale sighted in the southern GOM in 4 out of the 16 reports (25%). In August of 2002, an individual right whale, sighted in the southern GOM, was noted in only 9% (1/11) of the reports. However, 50% (5/10) of the 2003 reports indicated multiple right whales sighted in the southern GOM and, in 2004, 100% (11/11) of the reports mentioned multiple right whales in the area, including a group of 8-15 that were reported repeatedly, in the Great South Channel (GSC), throughout the month.[32] The Great South Channel is adjacent to the Sound and acoustic impacts causing right whales to deviate from this important feeding area, particularly during construction, have not been adequately addressed in the DEIS.

Avian and Bat Collisions

Finally, the study results chosen in making a determination of potential avian collisions with turbines appears to be arbitrary and capricious. The radar studies were conducted during spring migration (May 8 to June 7, 2002) and fall migration (September 3 to 30, 2002), corresponding to the peak migration periods of most night migrating neotropical songbirds and shorebirds. One radar used in the surveys ("TracScan") detects targets out to 4 nautical miles. A second radar used ("VerCat") detects targets passing within 3/4 mi of the radar. A total of 1,052,761 targets were observed by TracScan radar (approximately 38% of these in spring and 62% in fall). A total of 491,306 targets were

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[31] William Curry. 2004. Testimony to the Senate Committee on Commerce, Science and Transportation. http://www.whoi.edu/institutes/occi/currenttopics/abruptclimate_curry_testim.html Nov. 13 2004

[32] NOAA/NMFS. 2004b\. Right Whale Sighting Advisory System (SAS) http://whale.wheelock.edu/whalenet-stuff/reportsRW_NE/ Nov 13, 2004.

observed by VerCat radar (approximately 31% of these in spring and 69% in fall). Of those targets observed by VerCat, 127,697 (approximately 26%) were observed in the rotor swept zone. (Numbers of TracScan radar targets in the rotor swept zone were not mentioned in the EIS.)[33] During the daytime aerial surveys, 394,585 waterbirds were observed, with approximately 365 (or 0,09%) observed within the rotor swept zone.[34]

Despite these surveys, the DEIS/DEIR extrapolates the expected fatality rate based on 12 land-based wind farms (ranging from 0 to 2.8 fatalities/turbine/year), and conservatively applying the highest mortality rate (2.8 fatalities/turbine/year) to the proposed Cape Wind farm, an estimated 364 birds could be killed each year.[35] This number is absolutely not based on any of the radar surveys (which take into account the number of birds flying in the rotor-swept zone), nor the more conservative aerial and boat-based surveys (which do not account for night migration of birds, but does delineate between bird species), and rather relies on the already-known, not-very-applicable situation encountered with land-based wind farms not located in a major migratory path for birds.

In fact, results of avian studies (cited within the DEIS/DEIR) conducted at a wind farm in the Netherlands that estimated 14.6 to 51.1 fatalities/turbine/year.[36] This Dutch project located in a low-lying area adjacent to the Wadden Sea has recorded 'large numbers of migrants, including waterfowl, shorebirds, and some songbirds' during migrations that may be more similar to Cape Wind's location than other land-based sites in the United States. If this fatality rate was used, the bird impact could be between 1,898 and 6,643 birds per year.

Additionally, the National Wind Coordinating Council (NWCC) indicates that the rate of bird fatalities relates to the size of the turbines (or rotor swept zone), and thus

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[33] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at Appendix 5.7-E, p1.
[34] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at Appendix 5.7-E, p117.
[35] 2004 Cape Wind Energy Project Draft Environmental Impact Statement. Army Corps of Engineers at Appendix 5.7-E, p129.
[36] Winkelman, J.E. 1995. Bird/wind turbine investigations in Europe. Proceedings of National Avian-Wind Planning Meeting, Denver, CO, July, 1994. pp. 110-119.

comparisons must be made between unit of rotor swept zone, or per MW produced, not turbine.[37]

Bats are another species in danger of colliding with turbines. Like birds, very little is known about the potential impacts of a wind farm on bats. The DEIS/DEIR states that Nantucket Sound is not a preferred habitat for bats, and thus concludes that collision risk is likely extremely low. However, at least one bat species is known to migrate over large bodies of water. Thomas Kunz, a bat researcher at Boston University, recently spoke at a wildlife forum on the presence of bats in Nantucket Sound. He reported that anecdotal evidence exists for the presence of red, silver haired, and hoary bats as much as 70 miles offshore, but there is no scientific data to look at bats on Nantucket Sound.[38] Dr. Kunz noted a couple of hypotheses that transiting bats may be attracted to the turbines as potential roosts, or be attracted to the acoustic properties (both audible and ultrasound) produced by the turbines. Monitoring practices such as thermal detection might be used to detect the presence and frequency of bats (particularly migratory species) transiting Nantucket Sound.

Conclusion

The International Wildlife Coalition is supportive of clean, renewable, energy sources and their potential contribution to the reduction of greenhouse gases other pollutants in our environment. However, with that in mind, we would like to see the successful development of future onshore and offshore wind farms based on the success of the Cape Wind Project. This can only be accomplished with careful monitoring and citing of this project, thus minimizing or eliminating any negative impacts on the precious environment and wildlife resources in Nantucket Sound.

We appreciate the opportunity to comment and thank you for your time and consideration.

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[37] National Wind Coordinating Council. 2004. Wind turbine interactions with birds and bats: A summary of research results and remaining questions.

[38] Kunz, Thomas H. 2005. "Wind Power: Bats and Wind Turbines (Is the Allure of Green Energy Fading?)." Presented February 22nd at the *Wind Energy and Wildlife Public Forum*, Hyannis, MA

Sincerely,

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